

Proposed Modeling Scenarios

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Purposes for Which Natural Gas Market Assessments Are Used

Natural Gas Market Assessments and Forecasts support:

- ❑ Energy policy making and program implementation activities
- ❑ Relative economics of alternative electricity resource choices, such as
 - ◆ energy efficiency programs and standards
 - ◆ distributed generation choices (e.g., photovoltaics, combined heat and power)
 - ◆ new central station generation
- ❑ Energy costs for households and businesses
- ❑ Environmental impacts of natural gas market activity
- ❑ Electricity demand assessments
- ❑ Wholesale electricity and natural gas market procurement, including hedging
- ❑ Natural gas infrastructure requirements assessments



Electricity Analysis Office

Natural Gas Unit

Long-range assessments of the demand for natural gas evaluate drivers of:

- ❑ end use gas demand
- ❑ gas demand to serve grid-delivered end use electric generation
- ❑ mix of electric generation resources (e.g., renewables, coal) which substitute for gas-fired generation (either utilization or construction)

and are affected by:

- ❑ world, national, regional and state energy and environmental policies
- ❑ economic choices utilities make for generation capacity expansion



Modeling the World Gas Market

World Gas Trade Model - simplified

- ❑ general equilibrium model iterates world-wide regional natural gas demand & supplies, “investing” in new pipelines, if economic
- ❑ perfect foresight in making return-on-investment decisions
- ❑ resulting prices are those that would have to be sustained to make investments economic (under the assumed future conditions)

Thousands of assumptions are made about future conditions of complex, interacting key drivers

Provide insights on potential market outcomes under different plausible future conditions



WGTM Reference Case

Econometric approach: equations that well explain past gas market activities are enlisted to predict the future

- ❑ Many assumptions for WGTM independent input variables re: U.S. energy activities come from EIA Annual Energy Outlook 2010 Reference Case output
- ❑ Therefore, WGTM Reference Case is conditional wrt some AEO 2010 Reference Case underlying conditions/assumptions, e.g.,

EIA AEO acknowledges that inherent uncertainties require Reference Case results not to be viewed in isolation

- ❑ alternate market projections must be reviewed to gain perspective on how variations in key assumptions can lead to different outlooks for energy markets



Proposed Scope and Design of Natural Gas Market Assessment

Focus assessment on cases helpful to decisionmakers, rather than having a single point forecast be the primary product

The “business as usual” Reference Case only a starting point: reflects expert opinion and current perception of current conditions

Many future potential changes cannot be predicted accurately or even probabilistically, but are deeply uncertain

Alternative cases are needed for additional insights, especially about potential future structural changes to the market conditions or regulations

Staff requests parties comments on the proposed alternative cases’ topic question, structure, and assumptions



Proposed Alternate Cases

Cases A & B are designed to explore California's potential vulnerabilities, or opportunities, across a plausible range of conditions that could drive future wholesale gas market prices

- **A: High Gas Price Case** - assumes a plausible combination US-policy-driven and market conditions that would lead to higher national wholesale gas demand and higher gas prices
- **B: Low Gas Price Case** - assumes a plausible combination of US-policy-driven and market conditions that would lead to lower national wholesale gas demand and lower gas prices

[see accompanying charts for more detailed description]



Proposed Alternative Cases (cont'd)

Cases C & E are designed to explore California's potential vulnerabilities, or opportunities, across a plausible range of conditions that could drive future California gas demand, costs, and infrastructure additions

- ❑ **C:** High CA Gas Demand Case – assumes a plausible combination of CA-policy-driven conditions that would lead to high gas demand
- ❑ **E:** Low CA Gas Demand Case – assumes a plausible combination of CA-policy-driven conditions that would lead to low gas demand

Each of the above cases will have a stressed sensitivity case for snapshot years that also assumes occasional low hydroelectricity conditions, high summer, low winter temperatures, and robust economic conditions (**Cases D & F**)

[see accompanying charts for more detailed description]



Proposed Alternate Cases (cont'd)

Cases G & H are policy-relevant sensitivities designed to guard against one-side biases

Explore key uncertainties testing the claim that shale gas is a “game changer” for the U.S. gas market

- **G: Shale Environmental Mitigation Sensitivity Case** – assumes plausible combination of higher environmental mitigation costs or constraints on shale gas production

Explore potential market impacts of pipeline pressure limitations on transportation capacity

- **H: Reduced Pipeline Pressure Case** – assumes reduced pipeline pressures/capacities associated with new public safety limitations

[see accompanying charts for more detailed description]



Uncertainty Analysis Helps Decisionmakers

Policy decisions often seek to strike a balance between competing objectives

Decisions carry risk because the future is highly uncertain

- ❑ Accurate probability of complex future outcomes unachievable
- ❑ Even knowing what factors matter, and to what degree, is a challenge
- ❑ Consequences of actions based on one forecast are uncertain—another future can happen instead

Moderating the risks of decisionmaking requires understanding the ranges of forecasts and their consequences

Prudently selecting forecasts can moderate the risks of potential consequences of a specific decision

- ❑ Decisionmaker's risk tolerance is important

